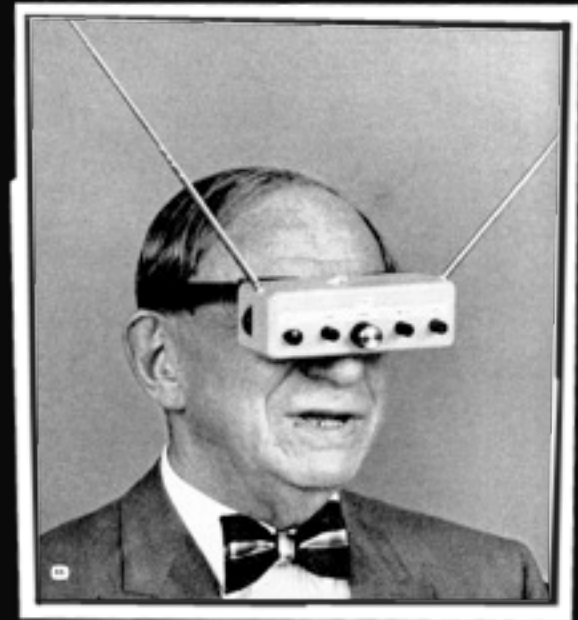


Mobile Augmented Reality 4 Learning

prof. dr. marcus specht
Centre for Learning Sciences
and Technologies

<mailto:marcus.specht@ou.nl>,
[socialmedia: marcuspecht](#)



Courtesy of “[Window to The Future](#)” By Steve Kosareff

Open Universiteit - CELSTEC
Centre for Learning Sciences and Technologies
Research Group Mobile Media

Prof. Dr. Marcus Specht, marcus.specht@ou.nl
**Mobile Media for Learning, Reflection, and Personal
Development**



Research Lines and topics

#1 Mobile and ubiquitous learning content

Ubiquitous access to learning support and distributed multi-format learning content.

- Mobile Video and Audio Content (Youtube EDU, iTunes U), Cloud-based learning content, Mobile data collection and aggregation, eBooks and tablet content.

#2 Orchestration of seamless learning support

Instructional design of nomadic and seamless learning support.

- Ubiquitous LMS access, Mixed Reality Games, Excursions and Field Trip systems, Mobile Augmented Reality, Mobile Learning Games, Object and location-based service access.

#3 Situated learning experiences

Connect the Learning and the real World, context-aware learning systems, sensor-based learning support.

- Experience sampling apps, Sensor-based learning, ambient displays, Context-aware social media, Smart-objects for learning

in your handout



Mobile Learning Applications Domains

- **eHealth and healthcare**
EMURGENCY: performance support and notification system, Handover procedures, Reference apps for daily practice
- **Law and Management education**
OpenScout, OUNL iPad pilots, UNHCR mobile simulated games
- **Architecture and creative industries**
MACE location-based content and social media, Cloud-based cooperation methods in design and architecture
- **Cultural Heritage**
Mixed reality field trips with Cultural Sciences
- **Logistics**
SALOMO: Situation Awareness and Mobile data collection
- **Language learning**
ELENA, PhD projects
- **Teacher education and networking**
mobile social networking apps

in your handout

Open Universiteit
www.ou.nl



Service and research portfolio

- **How to innovate?**

Innovation workshops for mobile media and learning in the OUNL *Learning Innovation Laboratory*, Desirability and technology acceptance studies of innovative solutions, Open innovation policy, open source frameworks

- **How to learn best?**

Educational and instructional design for blended and ubiquitous learning
Evaluation of increased awareness, efficiency, effectiveness.

- **How to implement your mobile learning support?**

Prototyping mobiles cross-platform and with embedded technologies.
Mashup and visualisation technologies for integrated solutions.
Customized mobile solutions integrating legacy software.

- **What is my return on investment?**

Piloting and evaluation of new solutions, following standardized methods.
Usability and acceptance studies (mobile eye-tracking).

- **How to optimize your existing processes for mobile learning?**

Content engineering and automation for mobile and web delivery.
Multi-platform access to legacy systems integrated in daily practices.

in your handout



#3 CELSTEC: leren in context



<http://code.google.com/p/arlearn/>

- *Augmented Reality Games,*
- *Excursions,*
- *Mixed Reality Games,*
- *Mobile Games and Simulations.*

Authoring

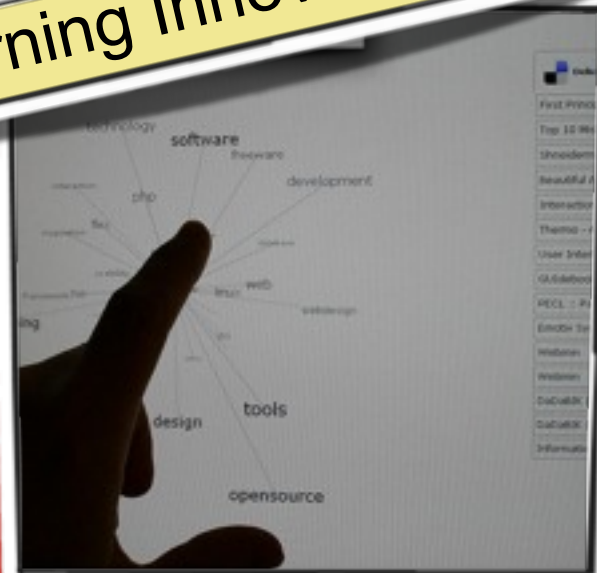
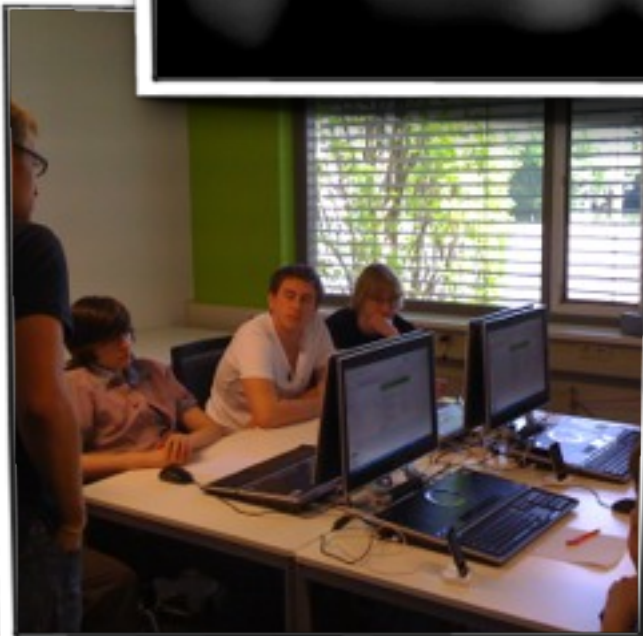
Mobiele App

StreetLearn



New media for learning and professional development

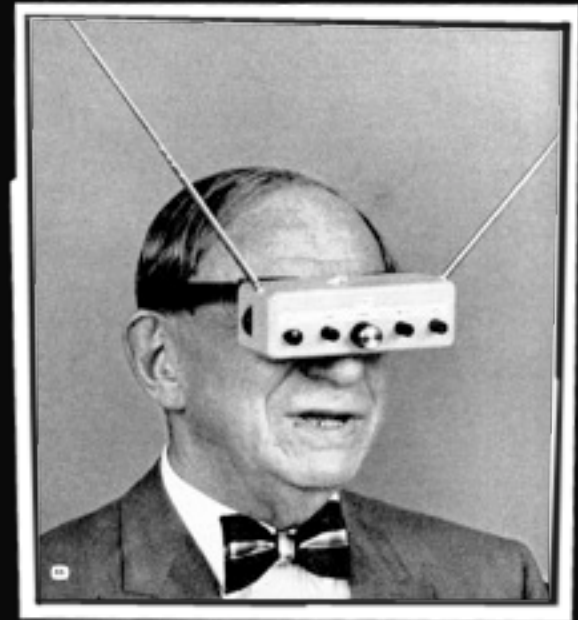
Learning Innovation Lab



Mobile Augmented Reality 4 Learning

prof. dr. marcus specht
Centre for Learning Sciences
and Technologies

<mailto:marcus.specht@ou.nl>,
[socialmedia: marcuspecht](#)



whitepaper online:

<http://www.e-learningevent.nl/e-blog>

youtube playlist:

<http://www.youtube.com/playlist?list=PLA2A5852D66C31396>

follow my blog for updates:

<http://www.marcuspecht.de>

follow OpenU Topic Mobiel Leren

<http://openu.nl>

<http://portal.ou.nl/en/web/topic-mobile-learning>

Mobile Augmented Reality for Learning

Marcus Specht
Centre for Learning Sciences and Technologies
Open Universiteit Nederland

based on Specht, M., Terrier, S., & Givallar, W. (2012). Mobile Augmented Reality for Learning: A Case Study. Journal Of The Research Center For Educational Technology, 7(1). Retrieved January 18, 2012, from <http://www.ou.nl/onderwijs/plaatsen/acties/122>



What is mobile augmented reality?

Components

embedded displays

camera

smartphones

HUDs

wireless networking

AR browsers

magnetometer

GPS

sensor technology

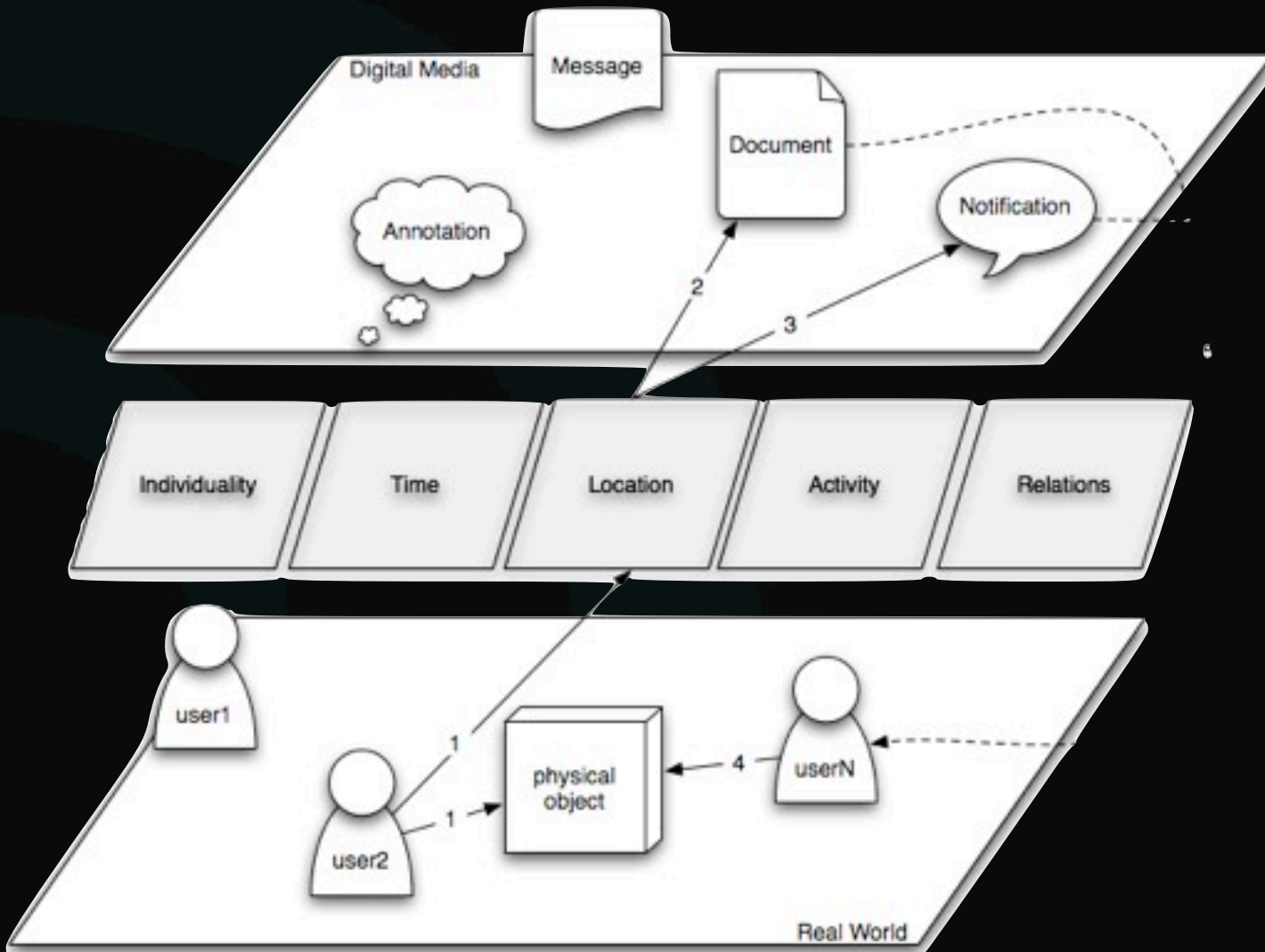
gyroscope

accelerometer

tagging and tracking

*Mobile Augmented Reality
is about linking digital and
real world artefacts based on
context parameters.*

concept

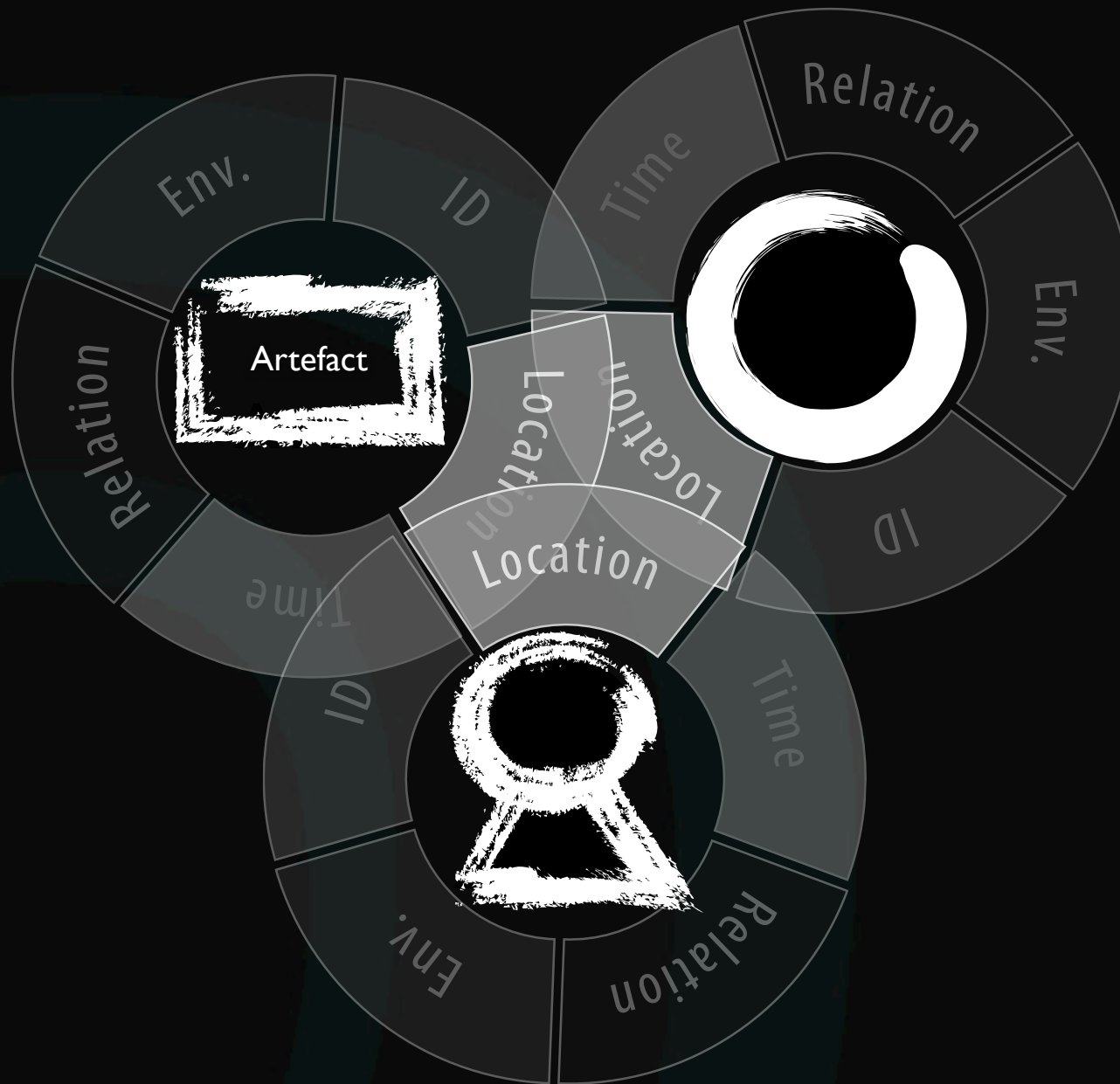


AICHE: *Ambient Information Channels*

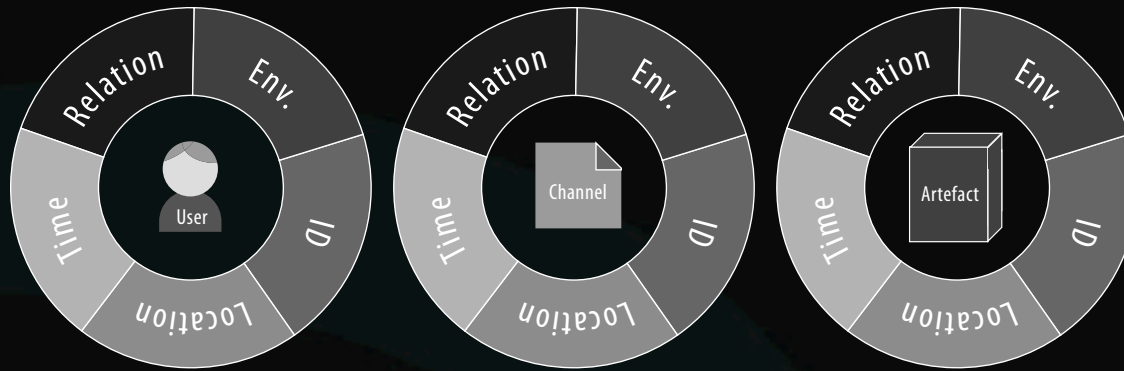


<http://www.designbynotion.com/metamirror-next-generation-tv/>

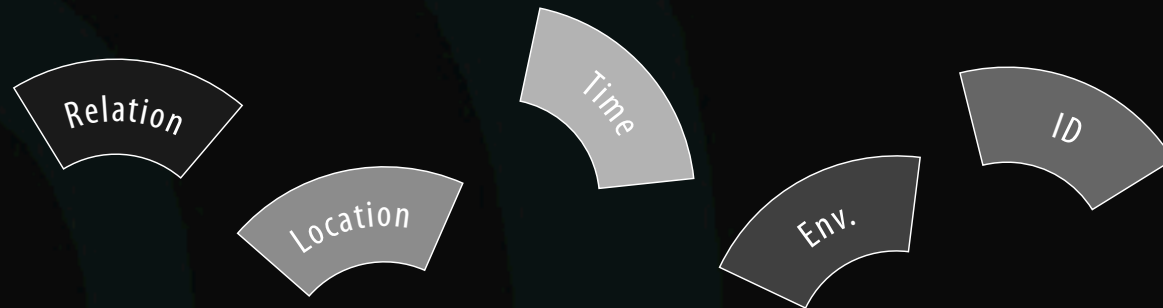
concept



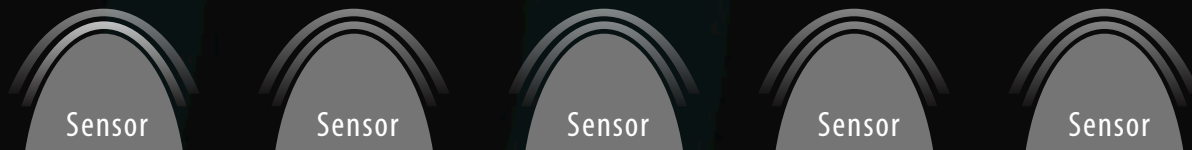
concept



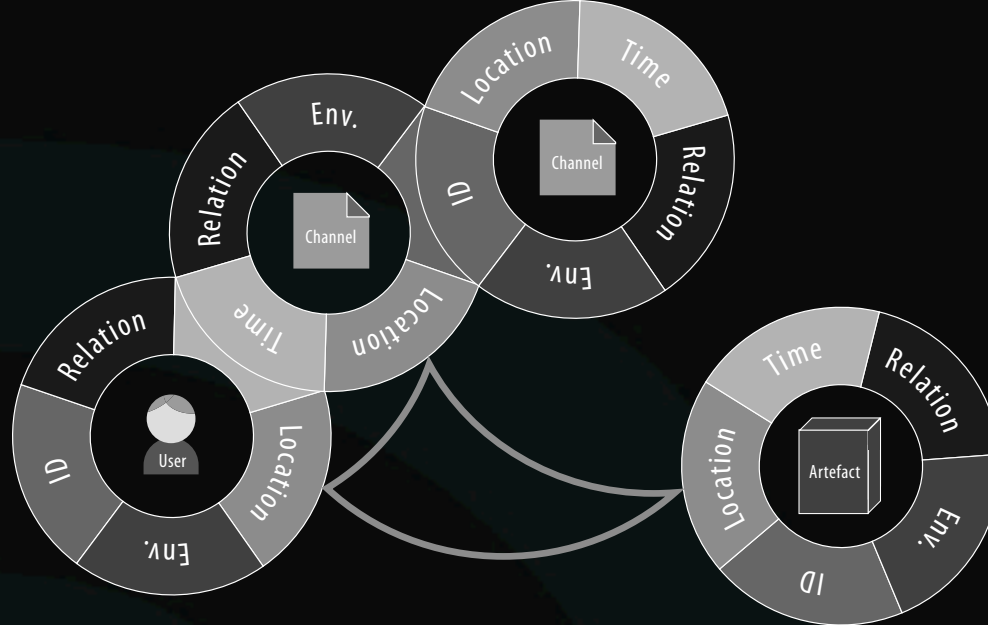
Enrichment



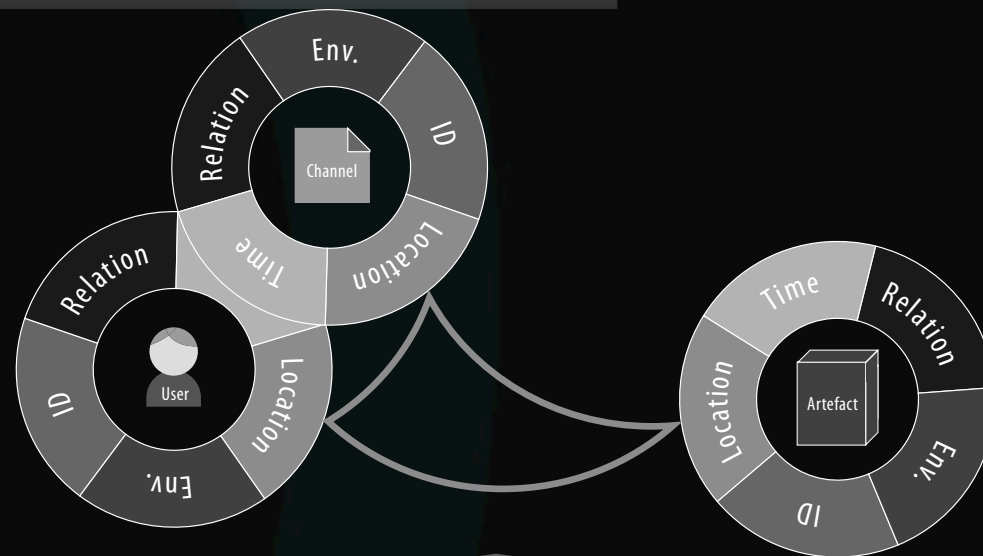
Aggregation



concept



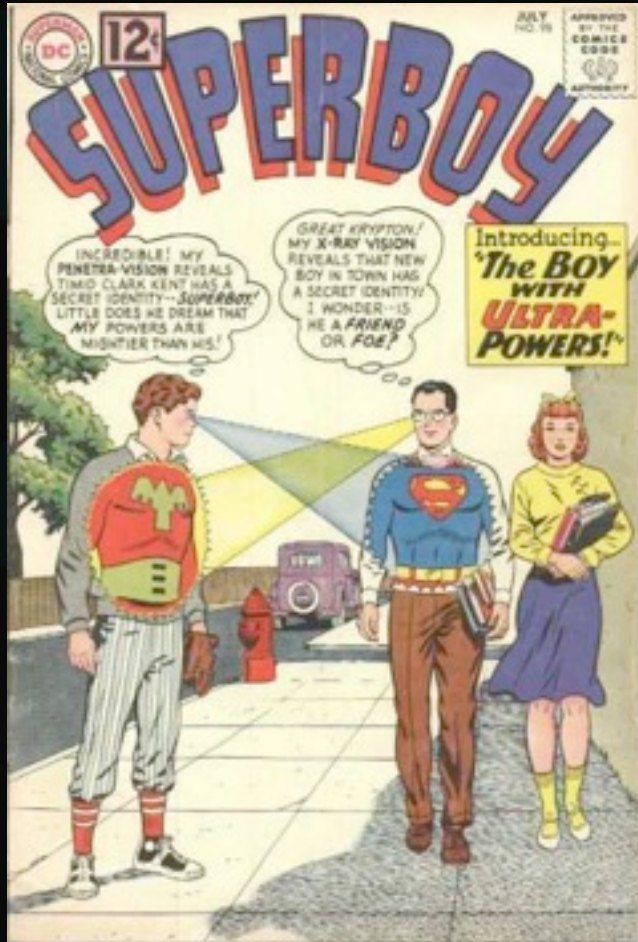
Framing



Synchronisation

Interaction

HCI Patterns



Interaction Patterns


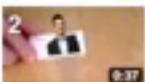






<http://uxmatters.com/mt/archives/2009/08/inside-out-interaction-design-for-augmented-reality.php>

playlist

Augmented Reality
by marcuspecht's video channel

Play All Share Like

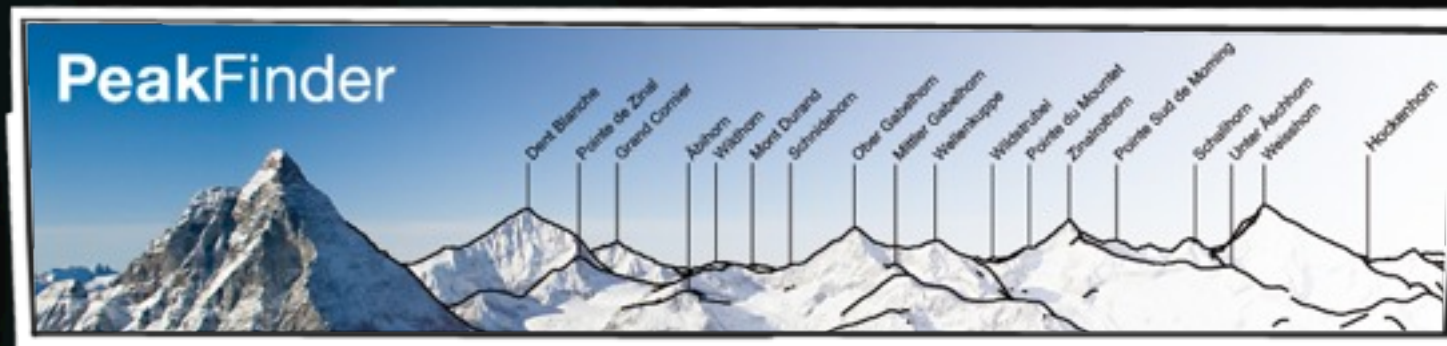
Examples of augmented reality applications.

1		BMW augmented reality by V431	626,142 views
2		Augmented Reality Business Card by augmentedrealitylab	113,116 views
3		Augmented Reality Business Card by cristenconline	37,967 views
4		ARtmmr - An augmented reality shooter by AELaGIT	676,405 views
5		PIT Strategy - Augmented Reality Board Game by BeyondReality09	75,151 views
6		Gizmondo Augmented Reality Game by lekarna	322,566 views
7		Wikitude AR Travel Guide (Part 1) by joo2322	297,862 views
8		Layar, worlds first mobile Augmented Reality browser by mclars	1,427,891 views



<http://www.youtube.com/playlist?list=PLA2A5852D66C31396>

HUD



<http://www.peakfinder.org/>

Tricorder



Holo chess



X-Ray Vision





Different Modalities

Educational Patterns



Educational Patterns

	Independent Context	Identity	Location	Environment	Time	Relation
Illustration	Dynamic 3D Objects					
Immersion		Augmented Books				
Exploration		RWO Scanners	Sensor Based Layers			
Reflection				Ambient Displays		
Collaboration	Dynamic 3D Objects					

multiple perspectives,
dynamic media, illustration,
enrichment, collaborative
digital media

3D Content
Educational Pattern

3D Dynamic Objects

3D Models to visualize concepts of the
learning content (Geometry, Math,
Astrology, Engineering, Architecture)

e n r i c h m e n t ,
immersion, situated
and contextualized
media

Augmented
Educational Pattern

Augmented Books

Enrich a book experience with augmented content, can be 3D Models or contextualized information.

RWO Scanners, Proxy

Scan RWO for additional information,
exploration driven.

Example: Language Learning

Sensor Based Layers

Present POI Information based on the current sensor information got from user device. Example: Wikitude

Collaborative Annotation

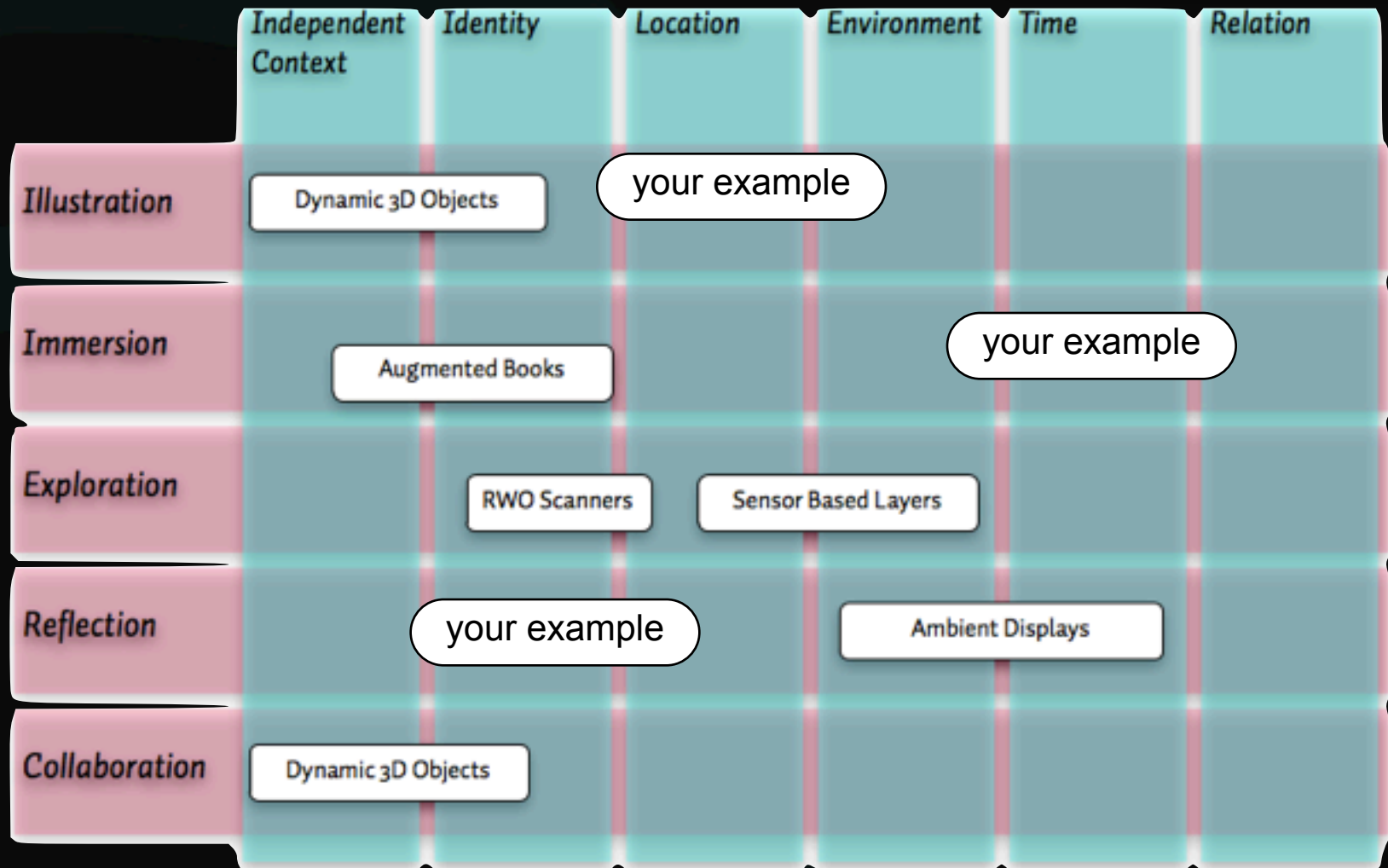
Shared digital annotations filtered by user context and following a learning logic.
Example: Locatory.

Reflection

Mijn grootouders hebben vroeger ook al stickers op de koelkast geplakt. Is het tegenwoordig anders omdat ik de stickers nu bekeek door een smartphone?

Augmented Reality (AR), dat doet toch iedere goede gids in een museum? Is het tegenwoordig anders omdat er geen gids meer is?

Reflection



meer weten ?

<http://portal.ou.nl/en/web/topic-mobile-learning/home>



Centre for Learning Sciences and Technologies

Open Universiteit
celstec.org

